Chairman and members of the board, three federal regulatory agencies are presenting a statement of joint recommendations today. My remarks reflect the concerns of the National Marine Fisheries Service, the US Fish and Wildlife Service and the US Environmental Protection Agency under the authority of the Endangered Species Act, the Magnuson-Stevens Fishery Conservation Act and the Clean Water Act. We understand that the diverse needs of the estuary and the multiple authorities that oversee those resources, present the board with a daunting task and we hope that this joint statement will reduce some of the potential confusion.

San Joaquin Basin salmonids face serious obstacles through the delta on their migration to and from the tributaries. Low flows are likely to delay, or even prevent, the successful movement of young fish downstream and adult fish upstream. Delayed migration increases exposure of fish to many threats to their survival including entrainment, predation and impacts from poor water quality. Exports from the south delta are likely to increase the negative impacts of low San Joaquin flows by further reducing their ability to navigate and by directly increasing the number entrained. Our analyses of the data at hand lead us to conclude that net flows at Vernalis are an important tool for the protection of San Joaquin salmonids and that flows to date have not been adequate to protect the salmonid populations. Flows at Vernalis need to ensure net flows through the delta that are adequate to guide fish to and from the rivers and bay.

Resident fishes of the delta, particularly the threatened delta smelt but also the related longfin smelt and the economically important striped bass and threadfin shad, require a somewhat different approach in their protection. The 2008 biological opinion on the Operations Coordination and Plan of California's state and federal water project impacts on delta smelt has put in place measures to protect that species from the impacts of the projects. In regard to export operations, these measures overlap broadly in the protective measures needed for salmonids, but the measures focus on flow conditions in lower Old and Middle rivers.

Flows through the delta and flows in lower Old and Middle rivers are both controlled in large part by export operations. There are significant issues in ensuring that the overlap is properly timed and is extensive enough to cover the needs of all listed species. The USFWS hopes that the Smelt Working Group that recommends real-time management for its recent BO will be able to coordinate with NMFS and the California Department of Fish and Game (DFG) for broad and effective protection of all species.

Some parties have characterized as a conflict in the protection of salmonids and resident fishes the use of a barrier at the head of Old River. We do not believe that the needs of the species are in conflict. Whether or not the barrier is in place the required Old and Middle river flows can be achieved by balancing river inflows with export rates. Work this year with a bubble barrier promises to provide a new tool in the protection of outmigrant salmonids at higher export rates.

The use of a bubble barrier highlights the rapidly expanding scientific work going on in this estuary. Much of the delta smelt opinion is based on published work of the highest quality

and more work is being published almost every month. The Salmon opinion enjoys a wealth of scientific information generated here and elsewhere. We have particularly used DFG's modeling efforts. The South West Fisheries Science Center is expected to substantially help us improve our understanding of factors affecting salmon survival through the south delta. Some of the unknowns that would most help future management if they were addressed include:

- Basic life stage data are needed for San Joaquin Basin steelhead.
- An integrated and scientifically sound model that can evaluate effects on salmonid life history stages through a complete life cycle.
- Are there secondary hydrologies, migration cues, or migration paths used by salmonids that could inform how water could be diverted without taking fish?
- Can salmonid behavior patterns, such as diel activity patterns, be used to increase their survival through the Delta?

We have closely followed the Vernalis Adaptive Management Program (VAMP) in the expectation that it would help address a number of information gaps. Unfortunately, the range of flows that have been available have not encompassed flows in the upper range of controllable conditions and measured survival has been disappointingly low. We urge the board to continue to use an adaptive management approach for this vital and volatile information need. New tools exist which greatly increase the amount and reliability of information gathered on salmonid passage. To maximize protection and to address the critical uncertainties regarding the level of flow needed, the board should take an active role in developing a replacement for the current VAMP design.

Purely as an example, a new flow requirement for VAMP might include high flow targets for different durations in every year rather than different levels of the same duration each year, as in the present design. Something like 7000 cfs for 1 week in critical years, 2 weeks in dry years, 3 weeks in wetter years and for 4 weeks or more in wet years would allow direct comparisons of salmon movements under different flow regimes in every year while providing good conditions to an increasing fraction of the outmigrant population across years. We emphasize that this is only an example of the sort of design that the Board should pursue in collaboration with academic and agency biologists.

Finally, we point out to the board that recently approved funding of restoration work on the San Joaquin River adds even more importance to providing a southern delta that salmonids can migrate through.

We hope that these comments are useful and we look forward to working with the Board as it works on this essential issue.